

## Claims

1. A method of inducing mucosal immunity against proteins and peptides in an individual comprising the step of administering by topical or lavage administration to mucosal  
5 tissue of said individual, a nucleic acid molecule that comprises a nucleotide sequence that either encodes a desired peptide or protein, wherein said mucosal tissue is selected from the group consisting of rectal, vaginal, urethral, sublingual and buccal.
- 10 2. The method of claim 1 wherein said nucleic acid molecule comprises a nucleotide sequence that encodes a protein and is operably linked to regulatory sequences.
3. The method of claim 1 wherein said nucleic acid molecule comprises a nucleotide sequence that encodes a  
15 protein which comprises at least one epitope that is identical or substantially similar to an epitope of an antigen against which an immune response is desired, said nucleotide sequence operably linked to regulatory sequences.
4. The method of claim 1 wherein said nucleic acid  
20 molecule is administered rectally.
5. The method of claim 1 wherein said nucleic acid molecule is administered vaginally.
6. The method of claim 1 wherein said nucleic acid molecule is administered sublingually.
- 25 7. The method of claim 1 wherein said nucleic acid molecule is administered into buccal tissue.
8. A method of immunizing an individual against a pathogen comprise the step of inducing mucosal immunity against a pathogen antigen in an individual by administering

by topical or lavage administration to the mucosal tissue of said individual, a nucleic acid molecule that comprises a nucleotide sequence that encodes a peptide which comprises at least an epitope identical or substantially similar to an  
5 epitope displayed on a pathogen antigen, wherein said mucosal tissue is selected from the group consisting of rectal, vaginal, urethral, sublingual and buccal.

9. The method of claim 8 wherein said nucleic acid molecule comprises a nucleotide sequence that encodes a  
10 protein and is operably linked to regulatory sequences.

10. The method of claim 8 wherein said nucleic acid molecule comprises a nucleotide sequence that encodes a protein which comprises at least one epitope that is identical or substantially similar to an epitope of an antigen against  
15 which an immune response is desired, said nucleotide sequence operably linked to regulatory sequences.

11. The method of claim 8 wherein said nucleic acid molecule is administered rectally.

12. The method of claim 8 wherein said nucleic acid  
20 molecule is administered vaginally.

13. The method of claim 8 wherein said nucleic acid molecule is administered sublingually.

14. The method of claim 8 wherein said nucleic acid molecule is administered into buccal tissue.